Access DB# 117165

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Raymond Alejandro Examiner #: 76895 Date: 03/17/04
Art Unit: 1745 Phone Number 30(571)272-1282 Serial Number: 10/017202
Mail Box and Bldg/Room Location: Remsen 6B59 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Metallization of Bacterial Cellulose for Electrical & Electronic Device Manufacture

Inventors (please provide full names): Evans et al

Earliest Priority Filing Date: 12/14/01

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please search for claims 12-16 & 21-23 (attached copy).

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STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: EAS	NA Sequence (#)	STN $108.11
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#)	Questel/Orbit
Date Searcher Picked Up:	Bibliographic ✓	Dr.Link
Date Completed: 3-19-04	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 5	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 70	Other	Other (specify)

PTO-1590 (8-01)

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=> file home
FILE 'HOME' ENTERED AT 20:30:27 ON 19 MAR 2004

=> display history full l1-

     FILE 'HCA, WPIX, JAPIO' ENTERED AT 20:09:30 ON 19 MAR 2004
L1        40359 SEA FUELCELL? OR FUEL?(2A)(CELL OR CELLS)
L2        22242 SEA FUELCELL? OR FUEL?(2A)(CELL OR CELLS)
L3        15047 SEA FUELCELL? OR FUEL?(2A)(CELL OR CELLS)
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L5       424814 SEA ELECTROLY?
L6       142953 SEA ELECTROLY?
L7        78772 SEA ELECTROLY?
     TOTAL FOR ALL FILES
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L9       674720 SEA MEMBRAN?
L10      129675 SEA MEMBRAN?
L11       39264 SEA MEMBRAN?
     TOTAL FOR ALL FILES
L12      843659 SEA MEMBRAN?
L13        3183 SEA BACTER?(3A)(CELLULOS? OR HEMICELLULOS? OR CELLULOLYT?
                )
L14         467 SEA BACTER?(3A)(CELLULOS? OR HEMICELLULOS? OR CELLULOLYT?
                )
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     TOTAL FOR ALL FILES
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L18           1 SEA L2 AND L6 AND L10 AND L14
L19           0 SEA L3 AND L7 AND L11 AND L15
     TOTAL FOR ALL FILES
L20           2 SEA L4 AND L8 AND L12 AND L16
L21           3 SEA L1 AND L13
L22           2 SEA L2 AND L14
L23           0 SEA L3 AND L15
     TOTAL FOR ALL FILES
L24           5 SEA L4 AND L16
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                ACETOBACTER? OR XYLINUM?
L26       12647 SEA GLUCONACETOBACTER? OR HANSENII? OR ATCC OR 10821 OR
                ACETOBACTER? OR XYLINUM?
L27        1086 SEA GLUCONACETOBACTER? OR HANSENII? OR ATCC OR 10821 OR
                ACETOBACTER? OR XYLINUM?
     TOTAL FOR ALL FILES
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                ACETOBACTER? OR XYLINUM?
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L33            2 SEA L1 AND L29
L34            0 SEA L2 AND L30
L35            0 SEA L3 AND L31
     TOTAL FOR ALL FILES
L36            2 SEA L4 AND L32

     FILE 'LCA' ENTERED AT 20:16:43 ON 19 MAR 2004
L37         3277 SEA MICROBE# OR MICROBIAL? OR BACTER? OR BACILL? OR
                 GERM# OR MICRORGANISM? OR MICROORGANISM? OR CULTUR? OR
                 COCCUS? OR COCCI# OR SPIRIL? OR SPIROCHET? OR ANAEROB?
                 OR PROTOZ? OR AMOEB? OR MICROBIC? OR MICROZ? OR ANIMALCUL
                 ? OR SPORE# OR MICROCOCC? OR MICROSPORE# OR SPOROZ?

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L38         6104 SEA L37(3A)(CELLULOS? OR HEMICELLULOS? OR CELLULOLY?)
L39         1016 SEA L37(3A)(CELLULOS? OR HEMICELLULOS? OR CELLULOLY?)
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L43            3 SEA L2 AND L39
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L46            3 SEA L17 OR L21 OR L33 OR L42

     FILE 'WPIX' ENTERED AT 20:29:14 ON 19 MAR 2004
L47            3 SEA L18 OR L22 OR L43


=> file hca
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=> d l46 1-3 all

L46  ANSWER 1 OF 3  HCA  COPYRIGHT 2004 ACS on STN
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AN 139:263143 HCA
ED Entered STN: 16 Oct 2003
TI Palladium-**bacterial cellulose membranes** for **fuel cells**
AU Evans, Barbara R.; O'Neill, Hugh M.; Malyvanh, Valerie P.; Lee, Ida; Woodward, Jonathan
CS Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN, 37831-6194, USA
SO Biosensors & Bioelectronics (2003), 18(7), 917-923
CODEN: BBIOE4; ISSN: 0956-5663
PB Elsevier Science Ltd.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 16, 43
AB **Bacterial cellulose** is a versatile renewable biomaterial that can be used as a hydrophilic matrix for the incorporation of metals into thin, flexible, thermally stable **membranes**. In contrast to plant cellulose, this material catalyzed the deposition of metals within its structure to generate a finely divided homogeneous catalyst layer. Exptl. data suggest that **bacterial cellulose** possesses reducing groups capable of initiating the pptn. of Pd, Au, and Ag from aq. soln. Since **bacterial cellulose** contained H2O equiv. to ≥200 times the dry wt. of the cellulose, it was dried to a thin **membranous** structure suitable for the construction of **membrane** electrode assemblies (MEAs). Results of a study with Pd-cellulose showed that it was capable of catalyzing the generation of H when incubated with Na dithionite and generated an elec. current from H in an MEA contg. native cellulose as the polyelectrolyte **membrane** (PEM). Advantages of using native and metalized **bacterial cellulose membranes** in an MEA over other PEMs such as Nafion 117 include its higher thermal stability at 130° and less gas crossover.
ST palladium **bacterial cellulose membrane electrolyte fuel cell**
IT Gluconacetobacter hansenii
(in prodn. of palladium-**bacterial cellulose membranes** for **fuel cells**)
IT Coconut (Cocos nucifera)
(nata de coco; in prodn. of palladium-**bacterial cellulose membranes** for **fuel cells**)
IT **Fuel cell** separators
Membrane, biological
(palladium-**bacterial cellulose membranes** for **fuel cells**)

IT 7447-40-7, Potassium chloride (KCl), uses
(**electrolyte**; in prodn. of palladium-**bacterial cellulose membranes** for **fuel cells**)
IT 1333-74-0, Hydrogen, uses
(hydrogen crossover in palladium-**bacterial cellulose membranes** for **fuel cells**)
IT 19168-23-1, Ammonium hexachloropalladate
(in prodn. of palladium-**bacterial cellulose membranes** for **fuel cells**)
IT 9004-34-6P, Cellulose, uses
(nata de coco and bacterial product of G hansenii ATCC 10821 (**Acetobacter xylinum**); palladium-**bacterial cellulose membranes** for **fuel cells**)
IT 7440-05-3, Palladium, uses
(palladium-**bacterial cellulose membranes** for **fuel cells**)
RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ammon, H; Anal Chem 1995, V67, P466 HCA
(2) Brown, A; Chem Soc (Lond) 1886, V49, P432
(3) Buchanan, R; A Weavers Garden 1987
(4) Cannon, R; Crit Rev Microbiol 1991, V17, P435 HCA
(5) Cotton, F; Advanced Inorganic Chemistry, fifth ed 1988
(6) Farah, L; US 4912049 1990 HCA
(7) Fontana, J; Appl Biochem Biotech 1990, V24/25, P253
(8) Franz, G; Methods in Plant Biochemistry, Carbohydrates (Chapter 8) 1990, V2, P291 HCA
(9) Geyer, U; Int J Biol Macromol 1994, V16, P343 HCA
(10) Greenbaum, E; Photobiochem Photobiophys 1984, V8, P323 HCA
(11) Heinze, T; Das Papier 1996, V12, P721
(12) Heinze, T; Macromol Chem Phys 1998, V199, P2341 HCA
(13) Hestrin, S; Nature 1947, V159, P64 HCA
(14) Hon, D; Cellulose 1994, V1, P1 HCA
(15) Lassig, J; Arch Biochem Biophys 1995, V322, P119 HCA
(16) Lee, I; Ultramicroscopy 2000, V82, P213 HCA
(17) Miller, G; Anal Chem 1959, V31, P426 HCA
(18) Ong, E; ACS Symposium Series 1993, V516, P185 HCA
(19) Schramm, S; Biochem J 1954, V57, P345
(20) Shultz, M; Biochem Biophys Res Comm 1995, V209, P1046 MEDLINE
(21) Stephens, R; US 4960763 1990 HCA
(22) Tiller, J; Biotechnol Appl Biochem 1999, V30, P155 HCA
(23) Yamada, Y; Biosci Biotechnol Biochem 1997, V61, P1244 HCA

L46 ANSWER 2 OF 3 HCA COPYRIGHT 2004 ACS on STN
AN 139:24145 HCA

ED Entered STN: 03 Jul 2003
TI Metallization of **bacterial cellulose** for electrical and electronic device manufacture
IN Evans, Barbara R.; O'Neill, Hugh M.; Jansen, Valerie Malyvanh; Woodward, Jonathan
PA USA
SO U.S. Pat. Appl. Publ., 15 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M004-86
ICS H01M004-88; H01M008-10
NCL 429042000; 429033000; 502101000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 10, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003113610	A1	20030619	US 2001-17202	20011214
PRAI	US 2001-17202		20011214		

AB A method for the deposition of metals in **bacterial cellulose** and for the employment of the metalized **bacterial cellulose** in the construction of **fuel cells** and other electronic devices is disclosed. The method for impregnating **bacterial cellulose** with a metal comprises placing a **bacterial cellulose** matrix in a soln. of a metal salt such that the metal salt is reduced to metallic form and the metal ppts. in or on the matrix. The method for the construction of a **fuel cell** comprises placing a hydrated **bacterial cellulose** support structure in a soln. of a metal salt such that the metal ppts. in or on the support structure, inserting contact wires into two pieces of the metal impregnated support structure, placing the two pieces of metal impregnated support structure on opposite sides of a layer of hydrated **bacterial cellulose**, and dehydrating the three layer structure to create a **fuel cell**.

ST **fuel cell** fabrication metalization **bacterial cellulose**; electronic device fabrication metalization **bacterial cellulose**
IT Catalysts
(electrocatalysts; metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Electric apparatus
Fuel cell electrodes
Fuel cells
Gluconacetobacter xylinus
Semiconductor devices

(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Platinum-group metals
Transition metals, uses
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Enzymes, uses
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Alkali metal salts
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Coating process
(metalization; metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Coconut (Cocos nucifera)
(nata de coco; metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT Polymers, uses
(sulfonated; metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT 9004-34-6, **Cellulose**, uses
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT 7440-05-3, Palladium, uses
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT 9000-07-1, Carrageenan 64366-24-1, Potassium carrageenan
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)
IT 7447-40-7, Potassium chloride (KCl), processes
(metalization of **bacterial cellulose** for elec. and electronic device manuf.)

L46 ANSWER 3 OF 3 HCA COPYRIGHT 2004 ACS on STN
AN 112:177044 HCA
ED Entered STN: 12 May 1990
TI **Microbial cellulose** as a building block resource for specialty products and processes therefor
IN Brown, R. Malcolm
PA USA
SO PCT Int. Appl., 37 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C12P019-04
ICS C12R001-01; C12R001-02; C12R001-05; C12R001-38; C12R001-41
CC 16-4 (Fermentation and Bioindustrial Chemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8912107	A1	19891214	WO 1989-US2355	19890530
	W: AU, BR, DK, FI, JP, KR, NO				
	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
	AU 8936967	A1	19900105	AU 1989-36967	19890530
PRAI	US 1988-199606		19880531		
	WO 1989-US2355		19890530		

AB Cellulose microfibrils were produced by fermn. using different bacterial species belonging to Acetobacter, Rhizobium, Agrobacterium, and Pseudomonas as fermenting microorganisms. Acetobacter xylinum was particularly preferred. **Microbial cellulose** finds a variety of uses, e.g., (1) nonwovens and films, (2) specialty carrier for battery fluid and **fuel cells**, (3) carriers for foods, cosmetics, skin/hair materials, and internal drugs, (4) diet fiber substitutes, (5) synthetic leather, (6) light-transmitting optical fibers, and (7) as substrate for growing mushroom, plant seed germination, and seedling development.

ST **cellulose bacteria Acetobacter** fermn biotechnol

IT Biotechnology
(**bacterial cellulose** in)

IT **Acetobacter xylinum**
Bacteria
(**cellulose** from, uses of)

IT Fermentation
(**cellulose**, by **Acetobacter xylinum**)

IT 9004-34-6, **Cellulose**, biological studies
(from **bacteria**, uses of)

=> file wpix
FILE 'WPIX' ENTERED AT 20:30:47 ON 19 MAR 2004
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FILE LAST UPDATED: 18 MAR 2004 <20040318/UP>
MOST RECENT DERWENT UPDATE: 200419 <200419/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

=> d l47 1-3 max

L47 ANSWER 1 OF 3 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2004-026345 [03] WPIX
DNC C2004-008844
TI Usage method of ligno cellulose group biomass, involves processing

organic acid solution obtained by decomposition of monosaccharide solution produced by hydrolyzing **cellulosic** fiber suspension, using **anaerobe**.

DC D16 E17 F09 H06
PA (IZUT-I) IZUTSU M
CYC 1
PI JP 2003213584 A 20030730 (200403)* 20p D21C011-04
ADT JP 2003213584 A JP 2002-5514 20020115
PRAI JP 2002-5514 20020115
IC ICM D21C011-04
ICS C10L003-06; C12S003-00
AB JP2003213584 A UPAB: 20040112

NOVELTY - Method involves separating digested liquid mixture obtained by immersing ligno cellulose group biomass in chemical solution, into cellulosic fiber suspension and digestion waste liquid. The organic acid solution obtained by decomposition of monosaccharide solution which is obtained by hydrolyzing cellulosic fiber suspension, is processed by anaerobe to produce combustible gas containing methane.

DETAILED DESCRIPTION - The organic acid solution is also obtained by hydrolyzing cellulosic fiber in cellulosic fiber suspension or monosaccharide in monosaccharide solution. The digestion waste liquid is separated into high and low concentration sodium ion containing liquids. The high concentration sodium ion containing liquid is supplied to a recovery boiler (11), to recover active ingredient such as sodium hydroxide of the chemical solution from the combustion residue. The low concentration sodium ion containing liquid is mixed with cellulosic fiber suspension. The carbon dioxide and hydrogen sulfide in combustible gas, are absorbed by the digested liquid mixture.

USE - For production of combustible gas used as fuel for engine of motor vehicles, **fuel** for **fuel cell** used for power generation, using ligno cellulose group biomass.

ADVANTAGE - The combustible gas containing methane is easily produced from the ligno cellulose group biomass, without need of heat resistant material.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the usage apparatus of the ligno cellulose group biomass. (Drawing includes non-English language text).

digester 1
diffusion washer 4
acid production tank 6
concentration separator 9
recovery boiler 11

Dwg.1/3

KW [1] 7382-0-0-0 CL PRD
FS CPI
FA AB; GI; DCN

MC CPI: D05-C14; E10-J02D1; E11-M; F05-A02B; H06-A04
DRN 0323-P; 0323-U
CMC UPB 20040112
M3 *01* M210 M211 M320 M416 M610 M620 M720 M904 M905 M910 N134 N161 Q020 Q233 Q413 R013
DCN: R00323-K; R00323-P

L47 ANSWER 2 OF 3 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-670419 [63] WPIX
DNC C2003-182787
TI **Fuel cell** electrode comprises support structure comprising **bacterial cellulose**, and transition metal catalyst disposed in or on the support structure.
DC L03
IN EVANS, B R; JANSEN, V M; O'NEILL, H M; WOODWARD, J
PA (EVAN-I) EVANS B R; (JANS-I) JANSEN V M; (ONEI-I) O'NEILL H M; (WOOD-I) WOODWARD J
CYC 1
PI US 2003113610 A1 20030619 (200363)* 15p H01M004-86
ADT US 2003113610 A1 US 2001-17202 20011214
PRAI US 2001-17202 20011214
IC ICM H01M004-86
ICS H01M004-88; H01M008-10
AB US2003113610 A UPAB: 20031001
NOVELTY - **Fuel cell** electrode comprises a support structure comprising **bacterial cellulose**, and a transition metal catalyst disposed in or on the support structure.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(a) a method for recovering the catalyst from the **fuel cell** electrode, which comprises burning or hydrolyzing the support structure;

(b) an **electrolyte membrane** for a **fuel cell**, which comprises a support structure comprising **bacterial cellulose**, and a metal salt disposed in or on the support structure;

(c) a **fuel cell** comprising an **electrolyte membrane**, an anode (12) disposed on one side of the **electrolyte membrane**, and a cathode (15) disposed on an opposite side of the **electrolyte membrane**, where at least one of the anode and the cathode comprises an electrode support structure comprising **bacterial cellulose**, and a catalyst disposed in or on the support structure;

(d) a method for impregnating **bacterial cellulose** with a metal, which comprises preparing a matrix comprising **bacterial cellulose**, and placing the

matrix in a solution of a metal salt for a period such that the metal salt is reduced to metallic form and the metal precipitates in or on the matrix; and

(e) a method for forming a **fuel cell**, which comprises preparing an electrode support structure comprising hydrated **bacterial cellulose**, placing the electrode support structure in a solution of a metal salt for a period such that the metal salt is reduced to metallic form and the metal precipitates in or on the support structure, dehydrating the electrode support structure to form an electrode material, dividing the electrode material into an anode and a cathode, preparing a **membrane** support structure comprising hydrated **bacterial cellulose**, placing the anode on one side of the **membrane** support structure, placing the cathode on an opposite side of the **membrane** support structure, and dehydrating the **membrane** support structure to affix the anode and the cathode to the **membrane** support structure.

USE - The electrode is used for a **fuel cell** (claimed).

ADVANTAGE - The **bacterial cellulose** is of low cost, lightweight, and low toxicity. The recovery of the catalyst from the **fuel cell** electrodes and **membranes** is simple, as the cellulose portion can be burned or hydrolyzed away from the metals using conventional methods and equipment.

DESCRIPTION OF DRAWING(S) - The figure is a schematic perspective view of the metallized cellulose cube having the contact wires inserted in it.

Anode 12

Platinum wires 13

Cathode 15

Cathode wires 16

Dwg.1B/6

TECH US 2003113610 A1UPTX: 20031001

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Components: The catalyst is palladium. The **fuel cell** electrode further comprises an electrically conductive current carrier that contacts the support structure, and an enzyme disposed in or on the support structure.

ABEX US 2003113610 A1UPTX: 20031001

EXAMPLE - A membrane electrode assembly for use in a fuel cell was constructed by layering catalyst and insulator layers. The palladium-cellulose layers acted as the catalyst for the two half-reactions of the fuel cell. To prepare an insulating layer, a cube of untreated bacterial cellulose was dehydrated on the gel dryer for 30 seconds to dry to a thin membrane. Catalyst membranes were prepared by insertion of platinum wires into a hydrated metallized cube before drying. A catalyst layer was prepared by

inserting 4 platinum wires (13) and 2 cathode wires (16) with a diameter of 0.1 mm into a cube of palladium-cellulose at regular intervals. The palladium-cellulose cube catalyst layer with the inserted wires was placed on top of the insulating layer and the drying process was repeated. This layered membrane assembly was cut in half, so that each half contained two platinum wires. These halves were used as the cathode and anode of the fuel cell.

FS CPI
FA AB; GI
MC CPI: L03-E04B

L47 ANSWER 3 OF 3 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1990-007480 [01] WPIX
DNN N1990-005794 DNC C1990-003233
TI Prepn. of mfd. articles - using microbiologically produced micro fibrils of cellulose.
DC A11 A14 D13 D16 F09 L03 U14 X16
PA (BROW-I) BROWN R M
CYC 17
PI WO 8912107 A 19891214 (199001)* EN 37p
RW: AT BE CH DE FR GB IT LU NL SE
W: AU BR DK FI JP KR NO
AU 8936967 A 19900105 (199012)
ADT WO 8912107 A WO 1989-US2355 19890530
PRAI US 1988-199606 19880531
REP 7.Jnl.Ref; GB 2065688; US 4352882; US 4378431; US 4400466; US 4416193; US 4692408; US 4745058; US 4788146
IC C12P019-04; C12R001-01
AB WO 8912107 A UPAB: 19930928
Manufactured articles comprise microfibrils of **bacterial cellulose** (I) prepd. as follows: (a) a **cellulose** -producing **microorganism** (II) capable of reversing its direction during **cellulose** synth. is **cultured** in a nutrient medium (comprising an agent (III) which interfered with crystn. but not polymerization) in an enclosed plastic container; (b) produced (I) is withdrawn from the culture; and (c) (I) is formed into the title article.

Prefd. (II) include Rhizobium, Agrobacterium, Pseudomonas, or Alcaligenes, pref. Acetobacter spp, esp. Acetobacter xylinum (partic. ATCC 53582). Prefd. (III) are glycerol, polyethylene glycol, or esp. carboxymethylcellulose. Opt. polyacrylonitrile is further grafted onto the cellulose. Prefd. articles may be formed into a sheet (esp. paper), or a film of thickness less than 0.1 micron (when an inorganic material may be vapour deposited on it, or epitaxially grown on it), and may also comprise magnetic or electrical materials, or thermosetting resins. The prepd. article may be formed into a cloth shape or foodstuff, etc.

USE/ADVANTAGE - The practical, versatile method affords an

improved **microbial cellulose** which is more dense and stronger than conventional celluloses. In addn., the produced microfibrils have a remarkably high length : dia ratio. The prods. are useful as substrates for flexible Tl superconductors, edible casings, and readily texturized, strong, permeable wall coverings, etc. as well as a very wide range of industrial and chemical uses, **fuel cell**, optical fibres. Prods. made from the **microbial cellulose** are less expensive and superior in props. to those made from microcrystalline cellulose.
0/0

FS CPI EPI
FA AB
MC CPI: A03-A05A; A10-A; A12-S05E; D05-C08; D05-H01; F01-B02; F01-D06; F01-E; L03-A01C
EPI: U14-F; X16-C
DRN 0113-U
PLC UPA 19930924
KS: 0003 0013 0214 0222 0230 0375 1279 1588 3198 1982 2020 2095 2121 2208 2236 2319 2322 2339 2344 2386 2481 2482 3226 2498 2499 2512 2513 2522 2524 2528 2551 2555 2595 2604 2628 2629 2632 2634 2645 2654 2669 2675 3256 2690 2714 2726 3270 2737 2739 2742 2743 2798 2801 2818 2819 2821 2840 2845 3311 0231 0239 2776

FG: *001* 014 028 034 037 04& 072 074 076 147 198 231 240 252 253 305 311 315 331 336 342 347 351 358 364 366 371 376 39& 402 408 409 435 443 447 45- 466 471 472 473 477 481 483 50& 501 502 504 506 509 51& 516 52& 523 525 540 541 542 551 560 566 567 570 572 575 58& 580 596 60- 611 619 62- 621 623 624 627 633 649 657 664 667 668 669 679 688 694 720 722 724 725
FG: *002* 014 04- 041 046 047 371 373 376 381 540 58& 688

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FILE 'HCA, WPIX, JAPIO' ENTERED AT 20:35:44 ON 19 MAR 2004
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L53 0 FILE WPIX
L54 0 FILE JAPIO
TOTAL FOR ALL FILES
L55 4 S L4 AND L51

FILE 'HCA' ENTERED AT 20:35:59 ON 19 MAR 2004
L56 2 S L52 NOT L46

=> d 156 1-2 all

L56 ANSWER 1 OF 2 HCA COPYRIGHT 2004 ACS on STN
AN 128:59315 HCA
ED Entered STN: 03 Feb 1998
TI Cellulase-containing cell-free fermentate produced from microorganism ATCC 55702
IN Dees, H. Craig
PA Lockheed Martin Energy Systems, Inc., USA
SO U.S., 13 pp., Division of U.S. Ser. No. 528,178.
CODEN: USXXAM
DT Patent
LA English
IC ICM C12N001-20
ICS C12N009-24; C12N009-42
NCL 435209000
CC 10-2 (Microbial, Algal, and Fungal Biochemistry)
Section cross-reference(s): 16, 17, 40
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5698429	A	19971216	US 1996-729819	19961008
	US 5789227	A	19980804	US 1995-528178	19950914
PRAI	US 1995-528178		19950914		

AB Bacteria which produce large amts. of cellulase-contg. cell-free fermentate have been identified. The parental bacterium (ATCC 55703) was genetically altered using nitrosoguanidine (MNNG) treatment to produce the enhanced cellulase producing bacterium (ATCC 55702), which was identified through replicate plating. ATCC 55702 has improved characteristics and qualities for the degrdn. of cellulosic waste materials for fuel prodn., food processing, textile processing, and other industrial applications. ATCC 55702 is an improved bacterial host for genetic manipulations using recombinant DNA techniques, and is less likely to destroy genetic manipulations using std. mutagenesis techniques.
ST cellulase manuf Pseudomonas mutant; **cellulosic** waste degrdn **Pseudomonas** cellulase fuel; sugar **cellulosic** waste manuf **Pseudomonas** cellulase
IT Fermentation
Food processing
Fuels
Pseudomonas
Pseudomonas cellulosa
(cellulase-contg. **cell**-free fermentate produced from

microorganism atcc 55702)
IT Carbohydrates, preparation
(cellulase-contg. cell-free fermentate produced from microorganism atcc 55702)
IT Solid wastes
(cellulosic; cellulase-contg. cell-free fermentate produced from microorganism atcc 55702)
IT Textiles
(processing; cellulase-contg. cell-free fermentate produced from microorganism atcc 55702)
IT 9012-54-8P, Cellulase
(cellulase-contg. cell-free fermentate produced from microorganism atcc 55702)

L56 ANSWER 2 OF 2 HCA COPYRIGHT 2004 ACS on STN
AN 91:209240 HCA
ED Entered STN: 12 May 1984
TI Biochemistry of cellulose degradation and cellulose utilization for feeds and for protein
AU Sadana, J. C.; Lachke, A. H.; Shewale, J. G.
CS Biochem. Div., Natl. Chem. Lab., Poona, 411 008, India
SO Journal of Scientific & Industrial Research (1979), 38(8), 442-53
CODEN: JSIRAC; ISSN: 0022-4456
DT Journal; General Review
LA English
CC 16-0 (Fermentations)
AB A review with 165 refs. discussing prodn. of single-**cell** protein, **fuel**, and glucose from cellulose [9004-34-6] decompn.; surface or solid fermns. of single-cell protein; prodn. of cellulases; and biochem. of cellulose degrdn.
ST review protein feed cellulose
IT **Fermentation**
(protein, of **cellulose**)
IT Proteins
(single-cell, manuf. of, from **cellulose fermn**
.)
IT 9004-34-6, biological studies
(fermn. of, for single-cell protein manuf.)

=> d his 157-

FILE 'REGISTRY' ENTERED AT 20:37:12 ON 19 MAR 2004
L57 1 S 9004-34-6

FILE 'LCA' ENTERED AT 20:37:23 ON 19 MAR 2004
L58 0 S L57(3A)(BACTER? OR L28 OR L37)

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L59           1 S L57(3A)(FERM# OR FERMENT? OR ACETOBACTER? OR RHIZOB? OR

     FILE 'HCA' ENTERED AT 20:39:08 ON 19 MAR 2004
L60         640 S L57(3A)(BACTER? OR L25 OR L37)
L61         490 S L57(3A)(FERM# OR FERMENT? OR ACETOBACTER? OR RHIZOB? OR
L62           2 S L4 AND (L60 OR L61)
L63           1 S L62 NOT (L46 OR L56)

=> d l63 1 all

L63  ANSWER 1 OF 1  HCA  COPYRIGHT 2004 ACS on STN
AN   104:189803  HCA
ED   Entered STN:  01 Jun 1986
TI   Fuel cell using quinones to oxidize hydroxylic
     compounds
IN   Hertl, William; Schaeffler, Robert G.
PA   Corning Glass Works, USA
SO   U.S., 7 pp.
     CODEN: USXXAM
DT   Patent
LA   English
IC   ICM  H01M008-20
     ICS  H01M008-22
NCL  429015000
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1
     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
     ---------------   ----  --------       ---------------  --------
PI   US 4578323         A    19860325       US 1983-544279   19831021
PRAI US 1983-544279           19831021
AB   A fuel cell producing electricity from the
     anaerobic oxidn. of hydroxylic compds. (alcs. or sugars) in the
     presence of a quinone has an anaerobic anode chamber contg. an
     electrode in contact with a polyhydroxylic compd. (R)-quinone fuel
     soln. and a cathode chamber contg. an electrode in contact with a
     conductive ionic soln.  The 2 chambers are connected by an
     ion-permeable means.  Pt, Rh, C, or graphite is used as the
     electrode.  When low mol. wt. alcs. are used, photoexcitation of Q
     is required.  Thus, a cell using a fuel soln. of
     10 wt.% ethylene glycol contg. 6 mM anthraquinone 2-sulfonic acid
     (ASA) produced a current, which was proportional with the pH of the
     fuel soln. for pH ≤12.  The current produced also depended on
     the concns. of ethylene glycol and R, as well as on R itself.
ST   alc quinone fuel cell; sugar quinone
     fuel cell; anthraquinonesulfonic acid fuel
     cell; ethylene glycol fuel cell
IT   Fuel cells
        (anaerobic, with alcs. and quinone)
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IT Molasses
(in anaerobic **fuel cells**, with quinone)
IT 84-48-0
(in anaerobic **fuel cells**, with alcs.)
IT 50-99-7, uses and miscellaneous 56-81-5, uses and miscellaneous
57-50-1, uses and miscellaneous 107-21-1, uses and miscellaneous
9004-34-6D, hydrolyzed 9005-25-8, uses and miscellaneous
9041-76-3
(in **anaerobic fuel cells**, with
quinone)